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# Replicating Intergenerational Longevity Risk Sharing in Collective Defined Contribution Pension Plans using Financial Markets

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## Abstract

Intergenerational risk sharing is often seen as a strong point of the Dutch pension system. The ability to absorb financial and actuarial shocks through the funding ratio allows for the smoothing of returns over generations. Nevertheless, it implicitly means that generations subsidize each other, which has its disadvantages, especially in the light of incomplete contracts and situations of hard regulation constraints. This paper highlights the advantages of intergenerational risk sharing as a main characteristic in certain collective pension plans, investigating if and how much of this can be replicated by individual participation in the market. Using a stylized model based on different pension plans such as “hard”/“soft” defined benefit, collective/“pure” defined contribution, this paper identifies the effects of an increase in life-expectancy as one of the most important demographic shocks. The existence of regulatory constraints modifies agents’ behavior so that they tend to choose individual investment to ensure their retirement savings. In the absence of regulatory constraints, individual investment under-performs and highly replicates pension fund performance. Thus, choosing collective participation is more rational. Moreover, as the effect of the shock is decomposed, a discussion of the absorption heterogeneity by different plans is presented.

**Keywords:** pension plans, individual investment, intergeneration risk-sharing, longevity.

**JEL Classification:** H55, J26.

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\*Corresponding Author: E-mail address: enareta.kurtbegu@univ-angers.fr NOTE: This study started during my visiting period in the Research and Innovation Department at CARDANO Risk Management, Rotterdam, Netherlands. I am particularly grateful to CARDANO research team as well as to EPEE research Lab for all their support. The author is responsible for any errors or omissions in this paper.

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